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FINAL REPORT
TASK 16 – Archaeological Studies
Cooperative Agreement between
US Department of Energy, Office of Civilian Radioactive Waste Management
And
University and Community College System of Nevada

David Rhode
Desert Research Institute
January, 2004

From December 1999 to September 2003, the Desert Research Institute (DRI) provided management support and technical services in support of cultural resources management activities for the US Department of Energy (DOE) Yucca Mountain Project (YMP). This effort was conducted as Task 16 of the Cooperative Agreement between the US Department of Energy's Office of Civilian Radioactive Waste Management (OCRWM) with the University and Community College System of Nevada (UCCSN). The activities conducted under Task 16 were performed on a level-of-effort basis, covering a broad range of support services to implement the cultural resources management program for YMP and to assist the environmental regulatory program and Native American interaction program. In particular, Task 16 covered the following program activities:

- ◆ ***Preactivity surveys, assessment of effects and mitigative treatments.*** Perform and document pedestrian cultural resources surveys to identify, characterize, and evaluate cultural resources on lands proposed for surface-disturbing YMP activities, as requested. Develop impact assessments of proposed actions on identified resources. Develop and implement treatment plans and mitigation strategies to protect the values of cultural resources subject to effect, as needed.
- ◆ ***Periodic monitoring.*** Monitor known cultural resource localities to assess potential YMP effects, and provide documentation of the monitoring results. Monitoring was conducted to assess cumulative effects of the site characterization phase of the Project, provide a baseline on site condition for any future phases of the Project, and provide a basis for recommendations on future cultural resource protection and management measures.
- ◆ ***Reporting.*** Prepare reports for documentation of data collected, cultural resources monitored, analyses conducted, or progress in implementing the PA and supporting program documents, and other reports as requested. These reports include quarterly reports of field activities, technical summary reports, the annual US Department of Interior Federal Archaeology questionnaire, and the annual report of progress in implementing the stipulations of the Programmatic Agreement, among others as requested.
- ◆ ***Artifact and records curation.*** Protect and maintain to federal standards collections of artifacts and associated records obtained from studies made by the YMP cultural resources management program. Update and maintain GIS-based electronic databases of cultural resources studies, results, and associated information.
- ◆ ***Analyses.*** Conduct artifact analyses appropriate to satisfying the research requirements stipulated by the Programmatic Agreement and the supporting Research Design. Prepare results of these analyses as parts of technical summary reports, and in other professional presentations and publications as appropriate.
- ◆ ***Native American interaction.*** Provide support to the Native American interaction program, including site visits, access to examine artifact collections, and consultations, studies, and reporting pertinent to

the Native American Graves Protection and Repatriation Act, American Indian Religious Freedom Act, or EO 13007.

- ◆ ***New programmatic agreement.*** Support YMP management in planning for development and implementation of a Programmatic Agreement to cover cultural resources management policies at Yucca Mountain after site characterization is completed.
- ◆ ***EIS support.*** Provide support for the YMP EIS process, including technical expertise to resolve public comments received during the draft EIS comment period, presence at public hearings as requested, or additional studies or data-gathering activities, as needed.
- ◆ ***Other support.*** Support consultations, site visits, monitoring activities, and other communications to BLM, SHPO, and other federal, State, County, and tribal agencies, on issues relating the implementation of stipulations of the PA, as necessary.

Progress on these activity areas was reported to the UCCSN on a quarterly and annual basis during the course of performance of Task 16. This final report summarizes accomplishments and deliverables provided to the YMSCO from 1999-2003 under Task 16.

1. Preactivity surveys, assessments, and mitigative actions

A total of 49 land access requests for preactivity cultural resources investigations were made under Task 16. Of these, 14 required preactivity surveys to be conducted. These preactivity surveys are listed in Table 1. Reports of these preactivity surveys are provided in the bibliography in Appendix A. In addition, several reports of preactivity surveys and other reconnaissance efforts (including site monitoring) that had been conducted prior to Task 16 were submitted to the YMP as part of Task 16 (also listed in Appendix A). The remaining requests were for proposed projects in areas that had previously been surveyed, were subsequently cancelled, or did not require cultural resources investigations for other reasons. Recommendations for these proposed projects were provided by letter or email to the YMP.

Assessments of cultural resources that may be affected by the Project resulted in test excavations and mitigative data recovery conducted at two archaeological sites, 26NY7869 (the Blue Tanks Site) and 26NY8677. Test excavations and artifact collection at 26NY7869 were conducted in the summer of 2002, and a report of these investigations (Varley and Rhode 2003) was submitted to the YMP in October, 2003. Mitigative collection of a small number of artifacts from 26NY8677 was conducted in February, 2002, in advance of expansion of the precast concrete yard (Page et al. 2002). In addition, several archaeological sites were located nearby proposed reclamation activities, and archaeologists monitored the reclamation activities to ensure that these sites were not subject to adverse effects from the activities.

2. Periodic monitoring

From 1999 to 2003, a total of 27 archaeological sites were revisited to conduct more detailed site recordation, further evaluate their historical and scientific significance, assess their existing condition, and to determine whether certain Project activities may have affected those sites. Several of these sites were revisited more than once, in order to monitor artifact movement or displacement.

3. Reporting

Approximately 50 reports and other deliverables were produced for Task 16, covering a range of task areas (Appendix A). These included 28 short reports of the results of preactivity surveys and monitoring efforts. Two larger reports on various aspects of archaeological and cultural interest include a CD-ROM version of *A Yucca Mountain Ethnobotany* (Rhode 2001) and *Reading the Stones: The Archaeology of Yucca Mountain* (Hartwell and Valentine 2002). A third, *The Blue Tanks Site: A Middle Archaic Occupation at Yucca Mountain* (Varley and Rhode 2003), was submitted to the Project in draft form just as the cooperative agreement expired. DRI made numerous data reports and report sections pertaining to cultural resources that were compiled into the DOE's Final Environmental Impact Statement. DRI prepared and

submitted several versions of a draft programmatic agreement for cultural resources management during the licensing and development phase of the project. DRI also prepared a treatment and data recovery plan for the Blue Tanks Site, submitted for review to the State Historic Preservation Office (SHPO). The overall report number noted above also includes annual reports on the implementation of the Programmatic Agreement for submittal to the Advisory Council on Historic Preservation (ACHP); annual artifact inventory updates; annual responses to the Department of Interior's Federal Archaeology Questionnaire; and contributions to the annual Site Environment Report. Not included in the overall report number are numerous letter reports and other communications to the YMP, or progress reports and annual work plans and proposals made to the UCCSN for purposes of the cooperative agreement administration.

4. Artifact and records curation.

Approximately 200 cubic feet of artifacts collected during projects associated with the YMP are curated at a facility meeting Federal curation standards (36 CFR 79) in Las Vegas. As part of Task 16, these artifacts were curated at a facility in the Park 2000 Complex near Eastern Avenue in Las Vegas. In September, 2003, the artifacts were moved to a new curation facility at the DRI's Southern Nevada Science Center, leased and managed by the DOE's NNSA/NSO. All records pertaining to the YMP archaeological studies program are archived in this facility as well.

In addition, as part of Task 16 archaeological site records and short reports were created as digital searchable pdf files, and a master archaeological GIS-based electronic data storage center was developed and implemented.

Finally, electronic copies of the archaeological database were supplied to the OCRWM for storage in their CACI system.

5. Data recovery and analysis.

Archaeological data recovery, involving the collection and analysis of artifacts and other data from archaeological sites, was conducted at two sites, 26NY7869 (the Blue Tanks Site) and 26NY8677. Additionally, artifacts previously collected at Yucca Mountain sites were examined to address research issues identified in the Project's Archaeological Research Design (DOE 1990), and chronometric studies were made to develop a workable obsidian hydration chronology of sites in the region.

At the first site, 26NY7869, prior monitoring had revealed that Project activities (specifically, grading and widening of an existing road) had adversely affected portions of this Middle Archaic occupation site. The site had been recommended as eligible for nomination to the National Register of Historic Places at the time it was recorded. DRI recommended that a treatment plan be developed to conduct data recovery mitigating the adverse effects that had occurred and were likely to occur in the future. The YMP agreed, and DRI prepared a data recovery plan for review by the SHPO and ACHP. In their review, the SHPO suggested that the site had not been formally determined to be eligible, and required additional information to assess eligibility. As a result, the YMP approved the plan to conduct surface collection and small-scale test excavations at the site, to determine eligibility and to develop additional management strategies for the site.

Field work was conducted in July 2002, and laboratory processing and analysis of artifacts was conducted from August 2002 to March 2003. A draft technical report of the results was prepared in 2003, and submitted to YMP in October. The site was found to be eligible for nomination to the NRHP based on its archaeological information potential. It is predominantly surficial in nature, although a diffuse buried cultural component might yet exist at the site. DRI recommended that the YMP take additional measures to protect the deposit from further disturbance by Project activities.

Concerning archaeological data recovery at site 26NY8677, this small surface scatter was located where a precast concrete yard was planned. The site had been collected when the precast yard was originally placed. When the precast yard was to be expanded, a few additional artifacts were found in the area of

proposed expansion. These artifacts were also collected, to augment the original collection and preserve the information content of the site. The small site is determined to be not eligible for the NRHP.

6. Native American interactions

In 2000, DRI personnel assisted DOE managers and M&O contractors in two Native American site update meetings, held in March and October at the DRI Southern Nevada Science Center in Las Vegas and the Yucca Mountain Site. Activities at these meetings included (1) participation in the comment process for the Environmental Impact Statement; (2) a presentation by OCRWM Manager Dr. Ivan Itkin; (3) a field visit to examine cultural resources in upper Fortymile Wash; (4) updated discussions on the status of site characterization, the EIS, and the development of a new programmatic agreement for the protection of cultural resources after site characterization has been completed; and (5) executive session of the CGTO members.

7. New programmatic agreement

A draft programmatic agreement for the conduct of cultural resources management during the licensing and repository development phases following site characterization, was submitted to the YMP in 2001. This draft version received comments from the SHPO and ACHP, and was subsequently revised and re-submitted in 2002. Following additional comments from the SHPO in 2003, a newly revised version was submitted again to the YMP in 2003. This version is undergoing additional revision as part of negotiations with the SHPO.

8. EIS support

In 2000, DRI support the YMP in its development of the draft and final environmental impact statement for the Yucca Mountain site. DRI archaeologists attended several planning meetings with YMP and contractor personnel, to identify additional data needs and response resolution regarding cultural resources in potential transportation corridors, expressed in public hearings for the DEIS. As a result of these meetings, DRI personnel conducted a field excursion and site records searches/literature reviews of potential heavy haul routes, and re-tallied cultural resources data from the potential rail corridors to provide more detailed geographic information about abundance of cultural resources in these previously examined routes. These data were provided to the EIS contractor for incorporation in the revised EBF.

9. Other support

In 2001, the Nevada SHPO paid a visit to the Yucca Mountain area for the first time. During this field trip the deputy SHPO, Alice Baldrice, examined several cultural resources, discussed program measures for the protection of cultural resources and consultations with Native American groups having traditional ties to the Yucca Mountain area, and began discussions with YMP officials regarding the current program and future cultural resources preservation efforts.

Table 1. Preactivity Surveys Conducted As Part of Task 16.

YMP Request Number	Description	Date of Survey	Results	Report Number
00-011	Reclamation of Trenches and Miscellaneous Disturbances	10/24-25/00, 11/2/00, 11/6/00, 12/4-5/00	1 isolated artifact; recommended to proceed	SR102400-1 (Reed and Varley 2000)
01-005	Geophysical Test Locations	6/20/01	No resources in area; recommended to proceed	SR062001-1 (Rowland-Fleischmann et al. 2001)
01-008	Reclamation of Seismic Shotholes and Other Disturbances	10/17/01, 10/29/01, 11/20/01, 1/17/01, 2/5/02	1 eligible archaeological site, several isolates; monitoring recommended at 2 locations	SR101701-1 (Page et al. 2002)
02-001	Reclamation of PPK analog station	12/17/01	No resources in area; recommended to proceed	SR121701-1/CA650-02-12 (Martin et al. 2001)
02-002	WT-6 and Coyote Wash Water Sampling	11/20/01	No resources in area; recommended to proceed	SR112001-1 (Martin et al. 2001)
02-004	Precast Yard Expansion	02/01/02	1 archaeological site collected	SR020102-1 (Page et al. 2002)
02-005	Booster pump modification	02/05/02	No resources in area; recommended to proceed	SR020502-1 (Rowland-Fleischmann et al. 2002)
02-008	Seismic Monitoring Stations SD-9 & WT-2	07/11/02	No resources in area; recommended to proceed	SR071102-1 (Page and Rowland-Fleischmann 2002)
02-011	Large Block Removal	10/02/02	No resources in area; recommended to proceed	SR100202-1 (Rowland-Fleischmann and Ferguson 2002)
03-004	UNR Geophysical/Digital Seismic Network			In prep
03-005	Igneous Boreholes			SR080503-1 (Martin et al. 2003)
03-011	Backfill Trenches	On hold	Trenches to be surveyed	
03-014	Remove Rad Mon Stns	8/7/03	No resources in area; recommended to proceed	SR080703-1 (Martin 2003)
03-015	Remove Trailer	8/7/03	No resources in area; recommended to proceed	SR080703-2 (Fleischmann 2003)

Appendix A.

Reports Submitted to YMP as Part of Task 16.

- Canaday, T. and P. Buck
2000 *A Class III Cultural Resources Reconnaissance of Yucca Wash, Sever Wash, Fortymile Wash and Portions of Tonopah Wash and Fortymile Canyon for USGS Flood Chasing Activities, Yucca Mountain Project Area, Nye County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR062491-2.
- Hartwell, W. T., and A. DuBarton
2000 *A Class III Cultural Resources Reconnaissance for a Proposed Water Discharge Pipeline from Borehole SD-6 in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR041299-1.
- Hartwell, W. T., and S. Edwards
2000 *A Class III Cultural Resources Reconnaissance for Proposed Reclamation of Two Existing Trenches in Rock Valley in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR012699-1.
- Hartwell, W. T., and D. Valentine
2002 *Reading the Stones: The Archaeology of Yucca Mountain.* Topics in Yucca Mountain Archaeology 4. Desert Research Institute, Reno and Las Vegas.
- Haynes, G. M. and K. C. Anderson
2000 *Geomorphic Development at Selected Physiographic Settings and Implications for Archaeological Surface Sites near Yucca Mountain, Nevada.* Desert Research Institute Reconnaissance Short Report SR011298-1.
- Haynes, G. M., K. Varley, and S. Rowland-Fleischmann
2000 *Report on Fiscal Year 1996 Yucca Mountain Project Archaeological Monitoring Activities.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR102695-1.
- Haynes, G. M., K. Varley and S. Rowland-Fleischmann
2001 *Report on Fiscal Year 1997 and 1998 Yucca Mountain Project Archaeological Monitoring Activities.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR102196-1.
- Martin, C., S. Rowland-Fleischmann, D. Page, and K. Varley
2001 *A Class III Cultural Resources Reconnaissance of Two Water Sampling Study Areas in Association with Yucca Mountain Site Characterization Activities.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR112001-1.
- Martin, C., D. Page, S. Rowland-Fleischmann, and K. Varley
2002 *A Class III Cultural Resources Reconnaissance of Analog Seismic Station PPK in Association with Yucca Mountain Site Characterization Activities.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR121701-1. (BLM Report CA-650-02-12)
- Martin, C., S. Rowland-Fleischmann, K. Varley, and D. Page
2002 *Two Archaeological Sites Identified and Recorded During Miscellaneous Surveys in Association with Yucca Mountain Site Characterization Activities.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR021997-1.

- Page, D., C. Martin and K. Varley
 2002 *A Class III Cultural Resources Reconnaissance for the Proposed Reclamation of Twenty-five of Forty Seismic Shotholes and One of Three Miscellaneous Disturbances in the Yucca Mountain Project Area, in Association with the Yucca Mountain Site Characterization Project, Nye County and Lincoln County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR101701-1.
- Page, D., C. Martin and K. Varley
 2002 *A Class III Cultural Resources Reconnaissance of the Proposed Precast Yard Expansion in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR020102-1.
- Page, D., C. Martin, K. Varley and G. Haynes
 2002 *Report on Fiscal Year 2001 Yucca Mountain Project Archaeological Monitoring.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR100300-1.
- Page, D. and S. Rowland-Fleischmann
 2002 *A Class III Cultural Resources Reconnaissance for Installation of Seismic Monitoring Stations at USW-SD-9 and USW-WT-2 in Association with the Yucca Mountain Project (YMP), Nye County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR071102-1.
- Page, D., S. Rowland-Fleischmann and K. Varley
 2003 *Monitoring of Reclamation Activities Adjacent to Site 26Ny4763, in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR012903-1.
- Page, D., and K. Varley
 2002 *A Class III Cultural Resources Reconnaissance for the Proposed Reclamation of 6 of 41 Decommissioned Analog Seismic Stations in the Yucca Mountain Project Area and Vicinity, in Association with the Yucca Mountain Site Characterization Project, Nye County and Lincoln County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR100101-1.
- Page, D., and K. Varley
 2002 *A Class III Cultural Resources Reconnaissance for the Proposed Reclamation of Two Decommissioned Analog Seismic Stations in Association with the Yucca Mountain Site Characterization Project, Lincoln County, Nevada.* BLM Report NV04-02-1418P.
- Page, D., and K. Varley
 2002 *Report on Fiscal Year 2002 Archaeological Monitoring Activities, in Association with the Yucca Mountain Project, Nye County and Lincoln County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR100101-2.
- Reed, Kimberly and Kerry Varley
 2000 *A Class III Cultural Resources Reconnaissance of Thirty-six Proposed Reclamations of Trenches and Miscellaneous Disturbances Related to Site Characterization, in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR102400-1.
- Rhode, D.
 2001 *A Yucca Mountain Ethnobotany: Plants Useful to Native Peoples of the Southern Great Basin and Northern Mojave Desert. Topics in Yucca Mountain Archaeology 3.* Desert Research Institute, Reno.

Rowland-Fleischmann, S.

- 2003 *A Class III Cultural Resources Reconnaissance of the New Proposed Location for Digital Seismic Station Number 1 (DDS #1) for the Southern Great Basin Seismic Network in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR022295-1.

Rowland-Fleischmann, S., and S. Ferguson

- 2002 *A Class III Cultural Resources Reconnaissance for Removal of Large Blocks and Access Roads from the Area Around Busted Butte in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR100202-1.

Rowland-Fleischmann, S. and K. Varley

- 2000 *One Archaeological Site was Identified and Recorded During Miscellaneous Surveys for Fiscal Year 1999 in Association with Miscellaneous Yucca Mountain Site Characterization Activities.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR070199-1.

Rowland-Fleischmann, S., K. Varley and D. Page

- 2001 *A Class III Cultural Resources Reconnaissance for Proposed Geophysical Tests (Spectral-Analysis-of-Surface-Wave Measurements, and Shear-wave Refraction Measurements) on Yucca Mountain Crest, in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR062001-1.

Rowland-Fleischmann, S., K. Varley and D. Page

- 2002 *A Class III Cultural Resources Reconnaissance for the Tank Pad Preparation at the Booster Tanks, in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Cultural Resources Reconnaissance Short Report SR020502-1.

Varley, K., and D. Rhode

- 2003 *The Blue Tanks Site: A Middle Archaic Occupation in Fortymile Wash near Yucca Mountain, Nye County, Nevada.* Draft Report. Topics in Yucca Mountain Archaeology No. 5. Desert Research Institute, Reno.

Varley, K., and S. Rowland-Fleischmann

- 2000 *A Class III Cultural Resources Reconnaissance for Proposed Reclamation of 40 Decommissioned Analog Seismic Stations in Yucca Mountain Project Area and Vicinity, in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Reconnaissance Short Report SR070798-1.

Varley, K., and S. Rowland-Fleischmann

- 2000 *A Class III Cultural Resources Reconnaissance for Proposed Geodetic Monitoring Stations Busted, Mercury, and Repository in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Reconnaissance Short Report SR101598-1.

Varley, K., and S. Rowland-Fleischmann

- 2002 *A Class III Cultural Resources Reconnaissance of 8 Proposed Reclamation Areas of Site-Characterization Trenches and Pits and Site Monitoring of 12 Locations, in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Reconnaissance Short Report SR110698-1.

Varley, K., S. Rowland-Fleischmann and G. Haynes

- 2000 *Report on Fiscal Year 1999 Yucca Mountain Project Archaeological Monitoring Activities.* Desert Research Institute Reconnaissance Short Report SR110498-1.

Varley, K., S. Rowland-Fleischmann, D. Page and C. Martin

2002 *A Class III Cultural Resources Reconnaissance for the Proposed Reclamation of Two of Forty Seismic Shotholes in the Yucca Mountain Project Area, in Association with the Yucca Mountain Site Characterization Project, Nye County, Nevada.* Desert Research Institute Reconnaissance Short Report SR112001-2.